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AUTHOR: Zhabrev, I. P.

ORG: Krasnodar Branch, All-Union Oil and Gas Scientific Research Institute (Krasnodarskiy filial Vsesoyuznogo neftegazovogo nauchno-issledovatel'skogo instituta)

TITLE: Some problems in the use of mathematics in geology

SOURCE: Geologiya i geofizika, no. 5, 1966, 21-29

TOPIC TAGS: mathematical modeling, geological model, stochastic model, information theory

ABSTRACT: Using logical and mathematical methods, possible stochastic models are developed for the quantitative description of the boundaries of geological bodies and objects. These models are based on analogous ones of material objects described by I. A. Achkurin [Teoriya elementarnykh chastits i teoriya informatsiya - Sb. Filosofskiye probl. fiziki elementarnykh chastits. M. IL, 1963] as created in information theory, programming, and automation. The applications of the simplest models, those associated with information theory, to geology are described. Computations are made to determine the information required for one atom in different rock types, and ways are explored to eliminate unnecessary information. The possibilities of correlating geological sections on the basis of the information theory and of

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employing computers in these operations are examined. Orig. art. has: 2 tables and 3 formulas. [DM]

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Trudy Murm. biol. sta. 3:140-147 '57. (MIRA 11:2)
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USSR/Jet Propulsion Feb 1947
Aircraft - Propulsion

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"Za Oboronu" Vol XXIII, No 3

Discusses subject on popular level. Principle of operation explained. Types of jet propulsion engines discussed. "Shooting Star" and "Air Comet" performance discussed (with photographs). American-British conference on jet propulsion and gas turbines in 1945 is mentioned.

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[Airplanes, gliders, autogiros, helicopters] Samolet, planer, avtozhir, gelikopter. Moskva, Redizdat TsS Soiuza osoaviakhim SSSR, 1948. 192 p. [Microfilm] (MLRA 8:1)
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(Propellers, Aerial)

PHASE I BOOK EXPLOITATION SOV/3782

Zhabrov, Aleksey Aleksandrovich

Teoriya poleta i pilotirovaniya samoleta (Theory of Flight and Piloting of Airplanes) Moscow, Izd-vo DOSAAF, 1959. 411 p. Errata slip inserted. 10,200 copies printed.

Eds.: A.A. Vasil'yev, and V.I. Fedorov; Tech. Ed.: M.S. Karyakina.

PURPOSE: This is a textbook for self-instruction of students and young pilots.

COVERAGE: The textbook conforms with the program of USSR aeroclubs for teaching the theory of flight and piloting of propeller aircraft. The book also gives a brief outline of the theory of flight and piloting of jet planes. Basic aerodynamics, aerodynamic characteristics of aircraft, power plants, various regimes of aircraft flight, stability and maneuverability, acrobatic flight, and maneuvering characteristics of the Mig-15 bis airplane are discussed. The author used material from books by V.S. Pyshnov, I.V. Ostoslavskiy, V.F. Bolotnikov, B.T. Goroshchenko, P.M. Shirmanov, B.N. Yur'yev, N.A. Zaks, A.K. Martynov, and Ya.I. Levinson, and also from official publications on the aerodynamics and piloting of the Yak-18, Yak-11, and Mig-15 bis airplanes. There are no references.

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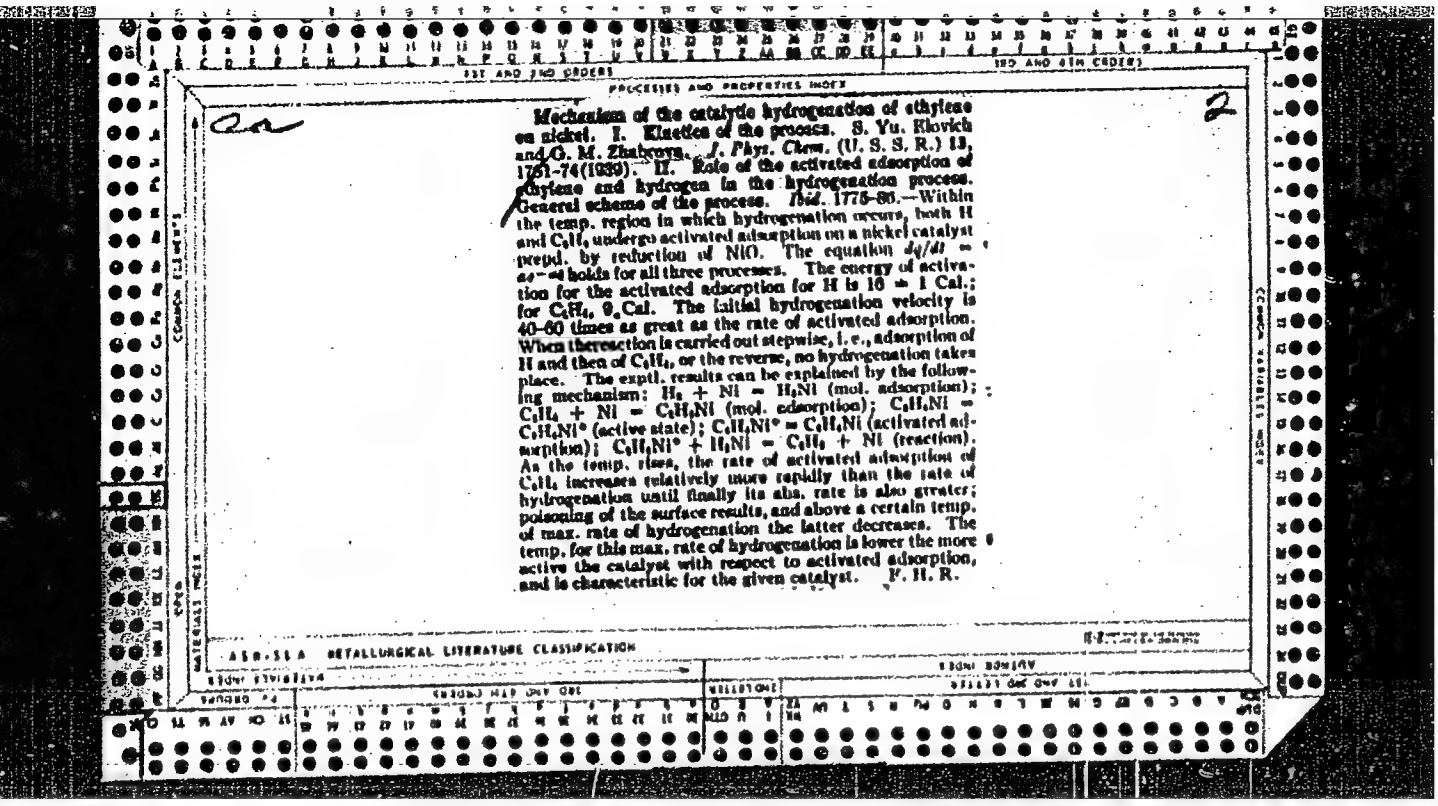
(Agricultural machinery)

ZHABROV, A.B., inzh.

Effect of some factors on the dumping range of rotary earth-throwers. Trudy VNIIGiM 42:133-137 '63. (MIRA 17:6)

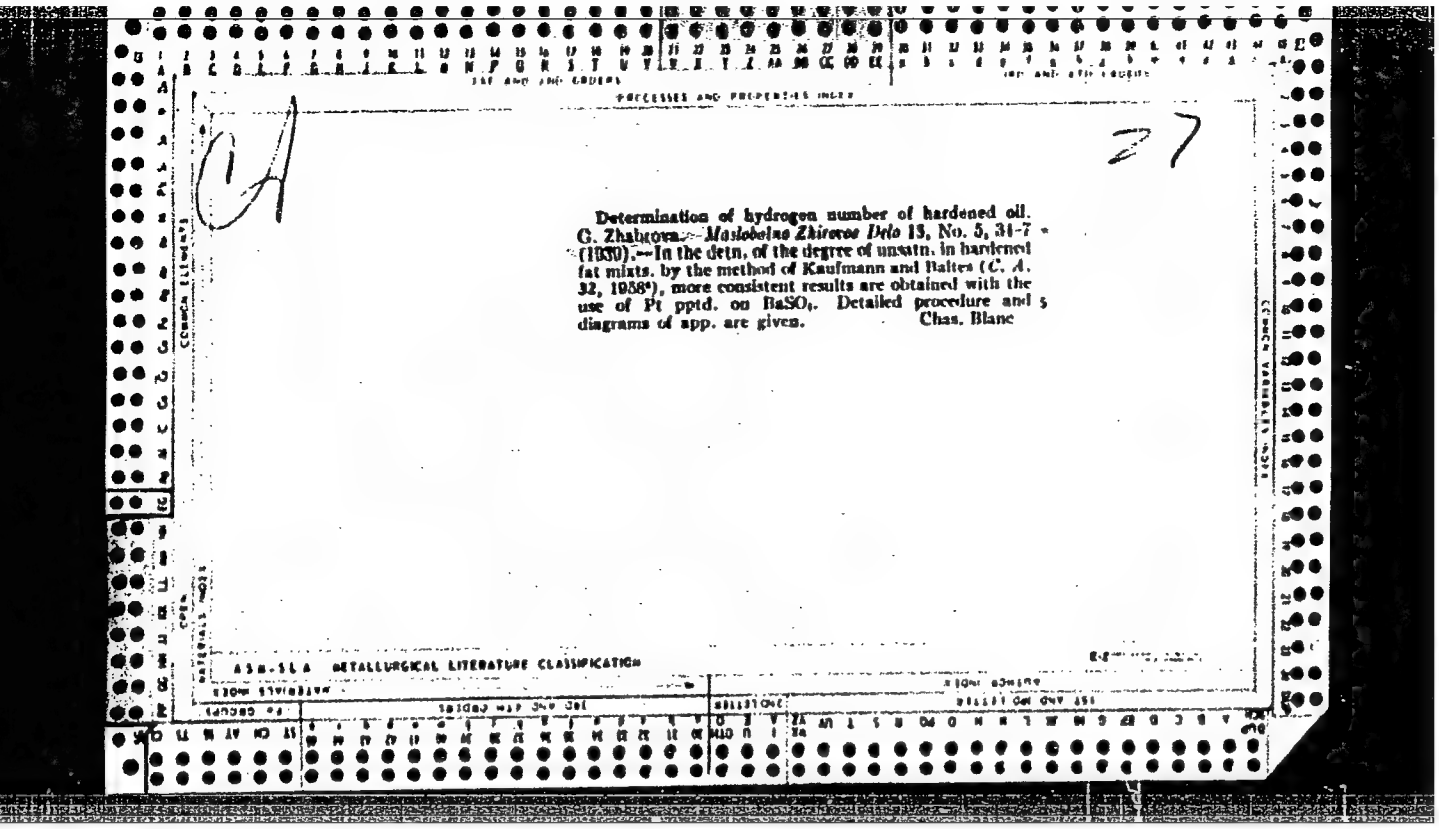


PROCESSES AND PROPERTIES INDEX

2

Mechanism of the catalytic hydrogenation of ethylene on nickel. I. Kinetics of the process. S. Yu. Elovich and O. M. Zhabrova. *J. Phys. Chem.* (U. S. S. R.) 13, 1761-74(1939). II. Role of the activated adsorption of ethylene and hydrogen in the hydrogenation process. General scheme of the process. *Ibid.* 1775-86.—Within the temp. region in which hydrogenation occurs, both H and C_2H_4 undergo activated adsorption on a nickel catalyst prepd. by reduction of NiO. The equation $dq/dt = ae^{-q}$ holds for all three processes. The energy of activation for the activated adsorption for H is 10 ± 1 Cal.; for C_2H_4, 9 Cal. The initial hydrogenation velocity is 40-60 times as great as the rate of activated adsorption. When the reaction is carried out stepwise, i. e., adsorption of H and then of C_2H_4, or the reverse, no hydrogenation takes place. The exptl. results can be explained by the following mechanism: $H_2 + Ni = H_2Ni$ (mol. adsorption); $C_2H_4 + Ni = C_2H_4Ni$ (mol. adsorption); $C_2H_4Ni = C_2H_4Ni^*$ (active state); $C_2H_4Ni^* = C_2H_4Ni$ (activated adsorption); $C_2H_4Ni^* + H_2Ni = C_2H_6 + Ni$ (reaction). As the temp. rises, the rate of activated adsorption of C_2H_4 increases relatively more rapidly than the rate of hydrogenation until finally its abs. rate is also greater; poisoning of the surface results, and above a certain temp. of max. rate of hydrogenation the latter decreases. The temp. for this max. rate of hydrogenation is lower the more active the catalyst with respect to activated adsorption, and is characteristic for the given catalyst. F. H. R.

A 38-51 A METALLURGICAL LITERATURE CLASSIFICATION



CA

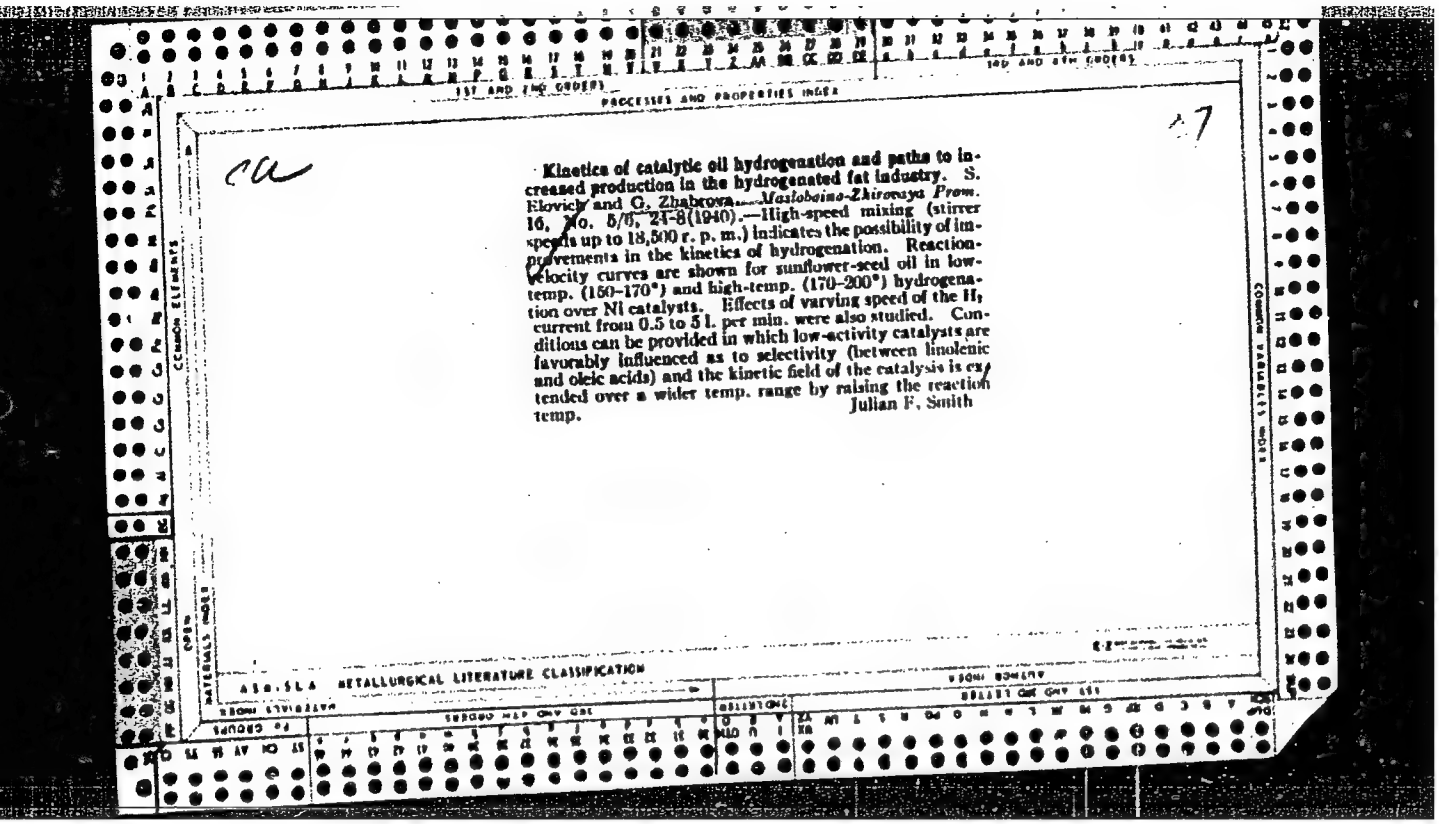
27

Determination of hydrogen number of hardened oil. G. Zhabrova. *Maslobelno Zhirovoe Delo* 15, No. 5, 31-7 (1939).—In the detn. of the degree of unsatn. in hardened fat mixts. by the method of Kaufmann and Baltes (*C. A.* 32, 1958⁸), more consistent results are obtained with the use of Pt ppid. on $BaSO_4$. Detailed procedure and 5 diagrams of app. are given. Chas. Blanc

ZHABROVA, G. M.

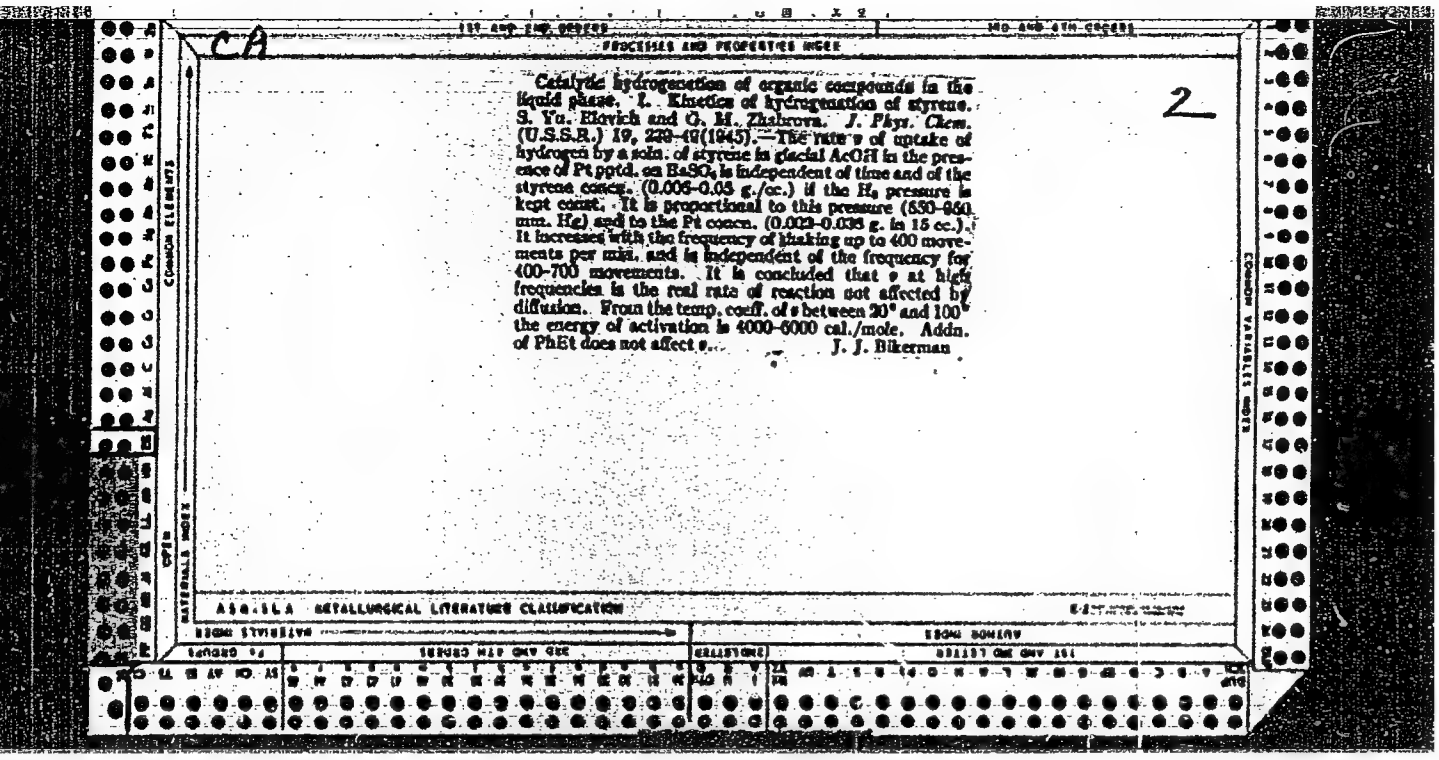
"The Activity of Nickel Hydrogenation Catalysts and Their Properties."

Zhur. Fiz. Khim., Vol. 14, No. 9-10, 1940.



Kinetics of catalytic oil hydrogenation and paths to increased production in the hydrogenated fat industry. S. Elovich and G. Zhabrova. *Maslobaino-Zhirovaya Prom.* 16, No. 5/6, 21-8(1940).—High-speed mixing (stirrer speeds up to 18,500 r. p. m.) indicates the possibility of improvements in the kinetics of hydrogenation. Reaction-velocity curves are shown for sunflower-seed oil in low-temp. (150–170°) and high-temp. (170–200°) hydrogenation over Ni catalysts. Effects of varying speed of the H_2 current from 0.5 to 5 l. per min. were also studied. Conditions can be provided in which low-activity catalysts are favorably influenced as to selectivity (between linolenic and oleic acids) and the kinetic field of the catalysis is extended over a wider temp. range by raising the reaction temp.

Julian F. Smith



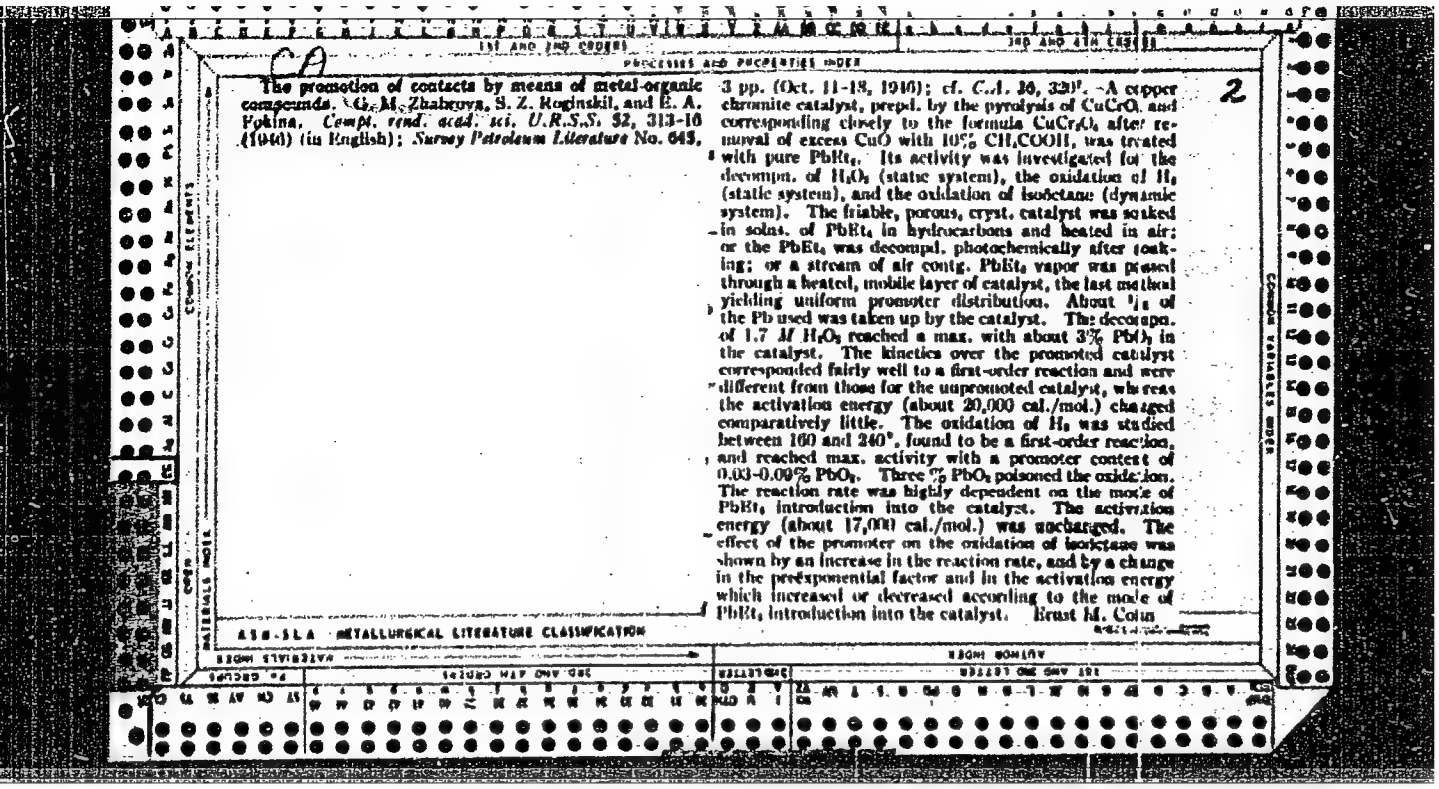
CA

PROCESSES AND PROPERTIES INDEX

2

Catalytic hydrogenation of organic compounds in the liquid phase. I. Kinetics of hydrogenation of styrene. S. Yu. Elovich and O. M. Zhabrova. *J. Phys. Chem.* (U.S.S.R.) 19, 229-49(1945).—The rate v of uptake of hydrogen by a soln. of styrene in glacial AcOH in the presence of Pt pptd. on $BaSO_4$ is independent of time and of the styrene concn. (0.008-0.05 g./cc.) if the H_2 pressure is kept const. It is proportional to this pressure (530-960 mm. Hg) and to the Pt concn. (0.023-0.038 g. in 15 cc.). It increases with the frequency of shaking up to 400 movements per min. and is independent of the frequency for 400-700 movements. It is concluded that v at high frequencies is the real rate of reaction not affected by diffusion. From the temp. coeff. of v between 20° and 100° the energy of activation is 4000-6000 cal./mole. Addn. of PhEt does not affect v. J. J. Bikerman

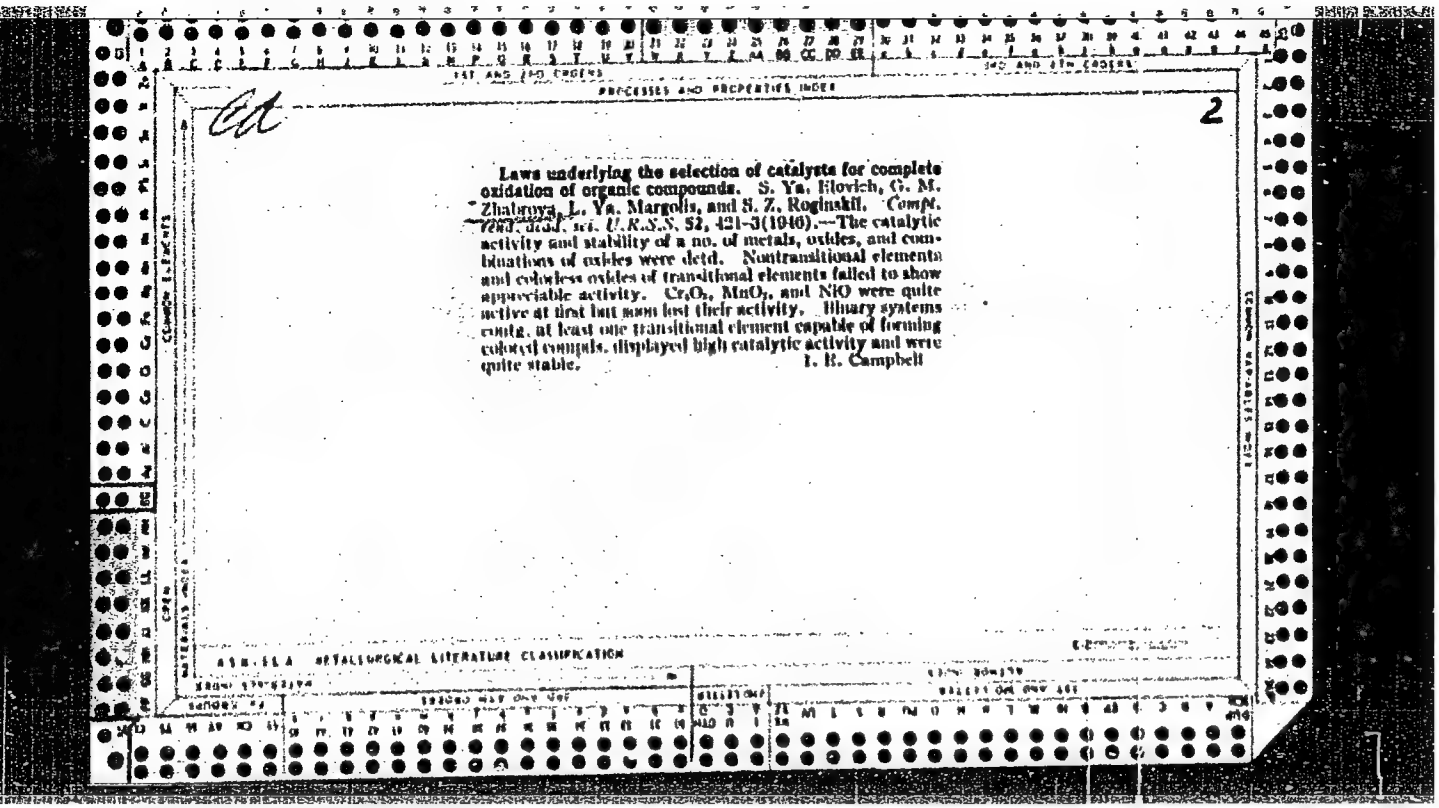
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



CA

The promotion of contacts by means of metal-organic compounds. G. M. Zhabrova, S. Z. Roginskii, and E. A. Pokina. *Compt. rend. acad. sci. U.R.S.S.* 52, 313-16 (1946) (in English); *Survey Petroleum Literature* No. 645, 3 pp. (Oct. 11-18, 1946); cf. *C.A.* 36, 3391. A copper chromite catalyst, prepd. by the pyrolysis of $CuCrO_4$ and corresponding closely to the formula $CuCr_2O_4$ after removal of excess CuO with 10% CH_3COOH, was treated with pure $PbEt_4$. Its activity was investigated for the decompn. of H_2O_2 (static system), the oxidation of H_2 (static system), and the oxidation of isooctane (dynamic system). The friable, porous, cryst. catalyst was soaked in solns. of $PbEt_4$ in hydrocarbons and heated in air; or the $PbEt_4$ was decompd. photochemically after soaking; or a stream of air contg. $PbEt_4$ vapor was passed through a heated, mobile layer of catalyst, the last method yielding uniform promoter distribution. About $^1/_3$ of the Pb used was taken up by the catalyst. The decompn. of 1.7 *M* H_2O_2 reached a max. with about 3% PbO_2 in the catalyst. The kinetics over the promoted catalyst corresponded fairly well to a first-order reaction and were different from those for the unpromoted catalyst, whereas the activation energy (about 20,000 cal./mol.) changed comparatively little. The oxidation of H_2 was studied between 160 and 240°, found to be a first-order reaction, and reached max. activity with a promoter content of 0.03-0.09% PbO_2. Three % PbO_2 poisoned the oxidation. The reaction rate was highly dependent on the mode of $PbEt_4$ introduction into the catalyst. The activation energy (about 17,000 cal./mol.) was unchanged. The effect of the promoter on the oxidation of isooctane was shown by an increase in the reaction rate, and by a change in the preexponential factor and in the activation energy which increased or decreased according to the mode of $PbEt_4$ introduction into the catalyst. Ernst M. Cohn

2

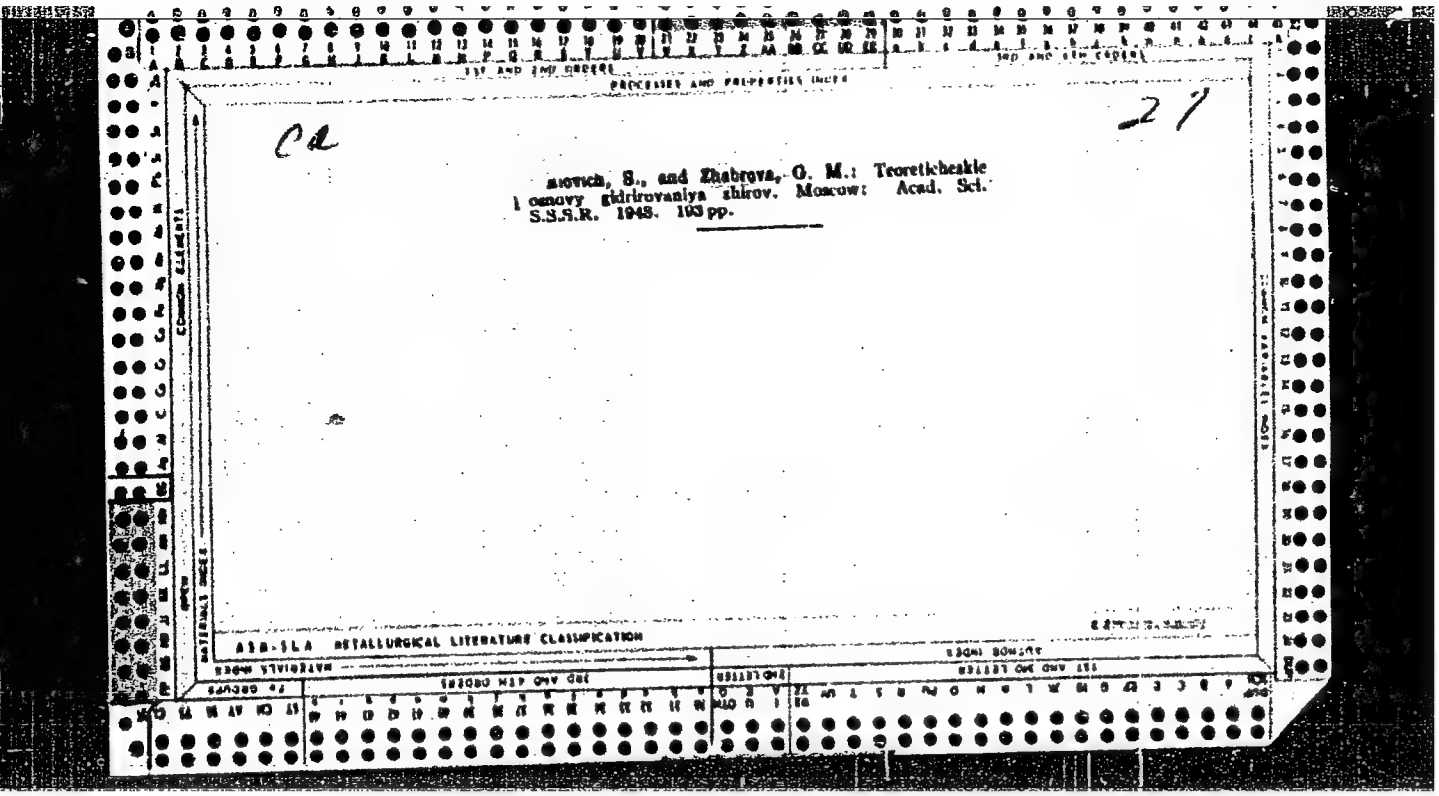


PROCESSES AND PROPERTIES INDEX

2

Laws underlying the selection of catalysts for complete oxidation of organic compounds. S. Ya. Bilovich, O. M. Zhalnova, L. Ya. Margolis, and S. Z. Roginskii. *Compt. rend. acad. sci. U.R.S.S.* 52, 421-3(1946).—The catalytic activity and stability of a no. of metals, oxides, and combinations of oxides were detd. Nontransitional elements and colorless oxides of transitional elements failed to show appreciable activity. Cr_2O_3, MnO_2, and NiO were quite active at first but soon lost their activity. Binary systems contg. at least one transitional element capable of forming colored compds. displayed high catalytic activity and were quite stable. I. R. Campbell

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



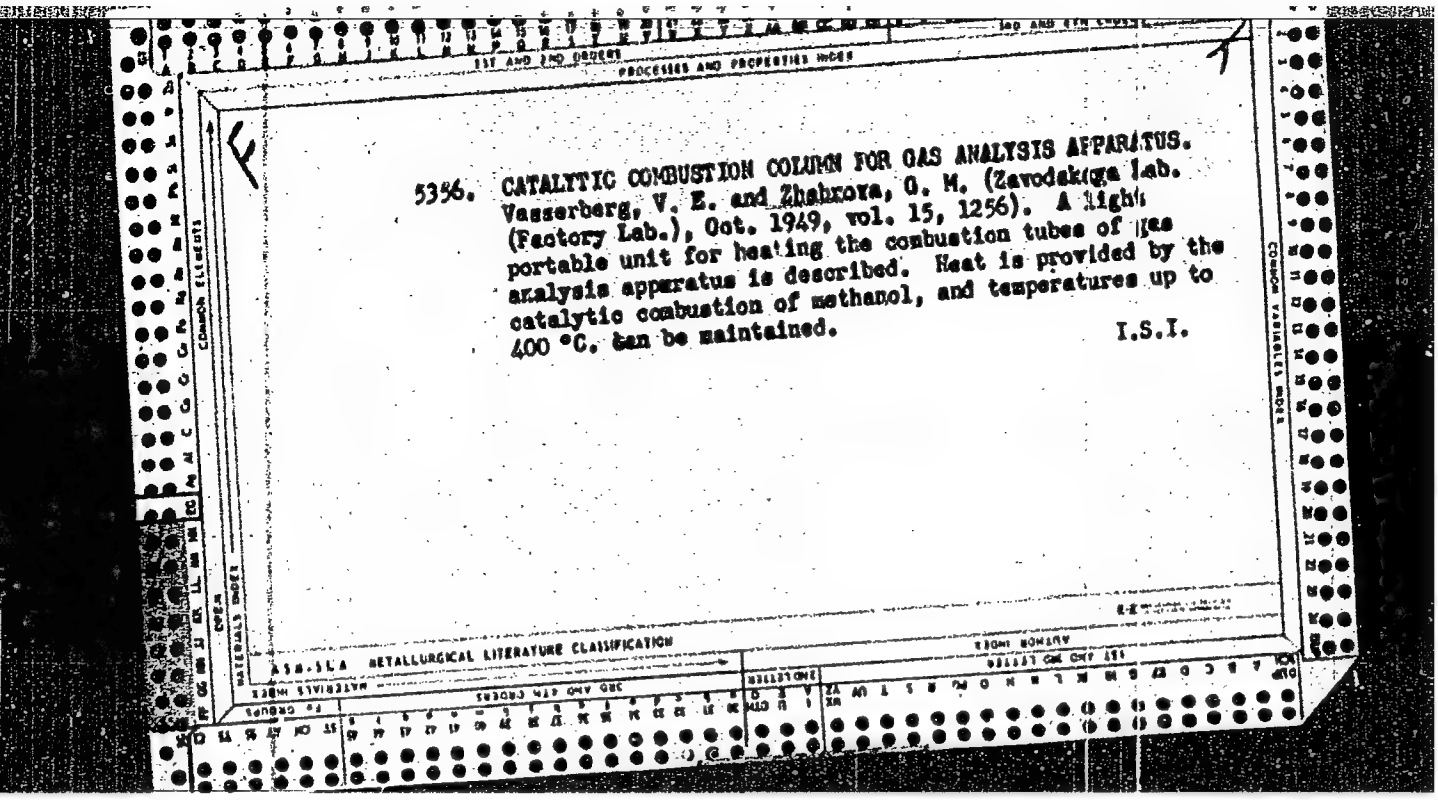
CA

27

Slovich, S., and Zhabrova, O. M.: Teoreticheskie osnovy gidrirovaniya shirov. Moscow: Acad. Sci. S.S.S.R. 1948. 103 pp.

53

Effect of promotion of catalysts by metallo-organic compounds. G. M. Zhabrova and E. A. Fokina. *Problemy Kinetiki i Kataliza, Akad. Nauk S.S.S.R. Otdelenie Obshchei i Prikladnoi Khimii*, 4, 151-8(1949).—Solid catalysts were treated with Ph$_4$Hg, Ph-Sn (I), and Ph-Sb (II), as well as Me_4Pb and Et_4Pb (III) in the presence of air. The catalytic activity was detd. as a function of concn. of metal oxides introduced by prepn. Decompn. of 5.7% H_2O_2 soln. by MgO treated with I was of 1st order with respect to H_2O_2. Decompn. accelerated with increase of concn. of I in MgO up to 0.6-0.8% SnO_2, but the rate decreased with further increase in Sn content. The position of the rate max. on the Sn-concn. axis did not change with increase of temp. from 65 to 75°. Similar results were obtained with II. Pure SnO_2 and Sb_2O_3 were catalytically inactive. The x-ray diffraction patterns of the promoted catalysts showed, however, presence of these oxides. Catalytic oxidation of H_2 with O_2 at 200° by NiO also followed 1st-order kinetics. NiO promoted by treatment with III showed highest activity at 0.5-1.0% PbO. Above 5-6% PbO, deviations from the 1st-order kinetics were observed. Pb-promoted NiO increased in activity in decompn. of H_2O_2 up to 33% PbO. Promotion effects were observed, in decompn. of H_2O_2, also in ZnO treated with Pb_2Hg and Ph_2Hg, and MnO_2 treated with III. Thus, catalysts of low, as well as high, activities were promoted [illegible] activity of Ni to decomp. H_2O_2 was promoted by treatment with III with an effect of the order of 5, Pt, at 1.2% Pb, the catalyst was poisoned [illegible] A. D.



5356. CATALYTIC COMBUSTION COLUMN FOR GAS ANALYSIS APPARATUS. Vasserberg, V. E. and Zhabrova, G. M. (Zavodskaya Lab. (Factory Lab.), Oct. 1949, vol. 15, 1256). A light portable unit for heating the combustion tubes of gas analysis apparatus is described. Heat is provided by the catalytic combustion of methanol, and temperatures up to 400 °C. can be maintained. I.S.I.

ZHABROVA, G. M.

USSR/Chemistry - Catalysts Sep/Oct 51

"Catalytic Properties and Structure of Active Zinc Oxide. Communication 4. Effect of Method of Preparation on Electron-Microscopic Structure of Zinc Oxide," A. B. Shekhter, G. M. Zhabrova, Inst of Phys Chem, Acad Sci USSR

"Iz Ak Nauk SSSR, Otdel Khim Nauk" No 5, pp 500-504

Electron-microscopic investigation of Zn oxide specimens prepd by thermal decompn of different Zn salts and by oxidation of Zn vapors in elec arc showed that method of prepn greatly affects structure of oxide. Found electron microscope method satisfactory

PA 195T4

195T4

USSR/Chemistry - Catalysts (Contd) Sep/Oct 51

for Zn oxide specimens with pores as small as 200-1,000 A in diam. Discusses formation of oxides.

195T4

USSR/Chemistry - Catalysts Jul/Aug 51

"Effect of Small Quantities of Additives on the Activity of Catalysts," G. M. Zhabrova, Moscow

"Uspekh Khim" Vol XX, No 4, pp 450-472

On the basis of 50% USSR and 50% foreign publications, discusses general concepts of the action exerted by catalysts, laws governing promoter action, catalyst poisoning, modification of catalysts (effect of the concn of additive on the activity of catalyst at constant temp; effect of temp on this activity at const concn of additive), electronic theory of modification.

191T4

ZHABROVA, G. M.

"USSR Work on Electronic Phenomena in Catalysis and Adsorption," Priroda, 42, No.2, pp 88-92, 1953

Translation W-26265, 26 May 53

Inst. Phys. Chem., AS USSR

ZHABROVA, G. M.

Chemical Abstracts
May 25, 1954
General and Physical
Chemistry

Factors that determine the dehydrogenating and dehydrative properties of zinc oxide. The effect of the method of preparation on the catalytic decomposition of isopropyl alcohol. G. M. Zhabrova, L. N. Kuteeva, and S. Z. Roginskii. *Doklady Akad. Nauk S.S.S.R.* 92, 569–72 (1953).—A difference in the method of prepn. of ZnO can produce a considerable difference in its catalytic activity with iso-PrOH. ZnO prepd. by pyrolytic method (from hydroxide, oxalate, carbonate, or nitrate) shows approx. the same activation energy of decompn. of iso-PrOH: 23,000–26,000 cal./mole; the specimens prepd. by direct oxidation of Zn vapor, however, give activation energy 48,000 cal./mole. The sp. surface values of the specimens differ: The prepn. from $Zn(NO_3)_2$ has 1.6 sq.m./g., that from $Zn(OH)_2$ 19.6; that from Zn metal 15.46; that from $ZnCO_3$ 10.4; that from ZnC_2O_4 14.2. At 296° the most active specimen is that derived from the oxalate, whereas that from metallic Zn is least active. At 366° the differences are less pronounced, at 400° they are all nearly alike and at 450° the specimen from Zn is 2.8 times as active as the oxalate-derived one. G. M. Kosolapoff

ZHABOVA, G.M.

USSR/ Chemistry - Catalysts

Card 1/1 Pub. 151 - 2/36

Authors : Zhabrova, G. M.; Roginskiy, S. Z.; and Fokina, E. A.

Title : Hydrogen peroxide decomposition catalysts

Periodical : Zhur. ob. khim. 24/1, 10-18, Jan 1954

Abstract : The catalytic activity of various oxides and salts, with respect to the decomposition of H_2O_2 in aqueous solutions, was investigated. The essential role of the homogeneous catalytic action of the dissolved catalyst in the H_2O_2 decomposition was established. It was found that the catalyst activity depends upon the orientation of the elements and their components in the D.I. Mendeleyevs' periodical system of elements and upon the chemical properties of the solid compound. Catalysts containing transition elements and possessing intensive coloration were observed to be more active than noncolored catalysts having no transition elements. The effect of free electrons on H_2O_2 decomposition is explained. Thirty-two references: 29-USSR; 1-USA; 1-English and 1-German (1852-1952). Table; graphs.

Institution : ...
Submitted : July 13, 1953

ZHABROVA, G.M.

(3)

Battelle Technical Review
July, 1954
Chemistry Physical

9374* Catalysts in Decomposition of Hydrogen Peroxide. (Russian.) G. M. Zhabrova, S. Z. Roginskii, and E. A. Fokina. *Zhurnal Obshchei Khimii*, v. 24, no. 1, Jan. 1954, p. 10-16.
Catalytic activity of a number of oxides and salts. Graphs, table. 32 ref.

10-13-54
mik

ZHABROVA, G. M.

USSR/ Chemistry Physical chemistry

Card : 1/1 Pub. 151 - 8/35

Authors : Zhabrova, G. M., and Kadenatsi, B. M.

Title : Experimental determination of the equilibrium constant of magnesium hydroxide decomposition reaction

Periodical : Zhur. ob. khim. 24, Ed. 7, 1135 - 1137, July 1954

Abstract : The reaction pressure equilibrium-constant and the equilibrium constant of $Mg(OH_2)$ decomposition reaction were determined at a temperature range of 380 - 650°. The value of the thermal-reaction effect (11 000 cal/mol) was established on the basis of experimental data obtained by equating the isochore curve. The installation used in determining the water-vapor pressure equilibrium, is shown in drawing. Four German and 1 USSR reference. Table, graphs, drawing.

Institution : ....

Submitted : January 9, 1954

ZHABROVA, G. M., ROGINSKIY, S. Z. and FOKINA, E. A.

"Catalysts of the Decomposition of Hydrogen Peroxide," Zhur. Obshch. Khim., 25, No.9, 1954

Comment B-87001, 27 Jul 55

Zhabrova, G. M.

USSR

Factors that determine the dehydrating and dehydrogenation properties of zinc oxide. The effect of adding acids, bases, and salts on the catalytic decomposition of isopropyl alcohol. G. M. Zhabrova, L. N. Kurtepa, and S. Z. Roginskii. *Doklady Akad. Nauk S.S.S.R.* 94, 73–6(1954); cf. *C.A.* 48, 5617d.—The effect was detd. of adding H_2SO_4, H_3PO_4, H_3BO_3, NaOH, $NaHSO_4$, Na_2SO_4, $MgSO_4$, $Al_2(SO_4)_3$, $ZnSO_4$, or $CuSO_4$ on the catalytic activity of a ZnO contact in the decompn. of iso-PrOH. The addn. of acids increases the dehydrating action, whereas alkalies decrease it. The effect of salts on the dehydrating action depends on their acid-base properties. The sulfates have the greatest pos. effect. The effect of $NaHSO_4$ has a pos. effect on the dehydration reaction, but a neg. effect on the dehydrogenation reaction. Pure ZnO is primarily a dehydrogenation catalyst but the addn. of compds. can affect its characteristics so that it will act as a dehydration catalyst.

J. Rovtar Leach

AF701597 TREASURE ISLAND BOOK REVIEW AID 831 - S

ZHABROVA, G. M. (Institute of Physical Chemistry, Akademii Nauk USSR) RADIOKHIMICHESKOYE ISSLEDOVANIYE MIKROKHIMII POVERKHNOSTI OKISNOTSINKOVOGO KATALIZATORA (Radiochemical study of the microchemistry of the surface of the zinc oxide catalyst). In Problemy kinetiki i kataliza (Problems of Kinetics and Catalysis), vol. 8. Izdatel'stvo Akademii Nauk SSSR, 1955. Section IV: Nature of the active surface. p. 209-217.

The nature of the active surface of catalysts is determined by their "microchemistry", i.e., the very small quantities of chemical substances found on the surface of the catalyst. They are capable of changing the electron levels of semiconductors, the concentration of electron-and hole gas, and the activity and selectivity of the catalyst. The study of the adsorbed "micro-admixtures" is done by the isotopic method. This paper discusses the decomposition of isopropyl alcohol over ZnO. Fig. 1 (p. 211) shows the kinetic curve of decomposition of isopropyl alcohol over ZnO.

Chemically pure substances were used in these experiments in order to diminish the effect of "micro-admixtures".

1/4

AID 831 - S

ZHABROVA, G. M., Radiokhimicheskoye . . .

The classification of catalysts proposed by S. Z. Roginskiy was used in order to change the "microchemistry" of the surface of ZnO, and thus modify the selectivity of the catalyst and cause dehydration.

Classification of processes proposed by S. Z. Roginskiy: 1) Processes involving transfer of electrons (oxidation, hydrogenation, dehydrogenation), and 2) processes which do not involve transfer of electrons (cracking, isomerization, dehydration). The chemical-electronic concept of the active surface of catalysts served as a basis for the formulation of the classification of admixtures. Classification of admixtures proposed by S. Z. Roginskiy: 1) Modifying admixtures (for oxidation-reduction reactions); they may possess donor-acceptor properties and change the catalytic activity by adsorption or formation of new chemical compounds on the surfaces of the catalyst); 2) Structure-forming admixtures which regulate the rate of physical macroscopic stages of the transfer of the substance and of heat during the catalytic process; 3) Stabilizing admixtures which increase the mechanical and chemical resistance of the catalyst; 4) Contact poisons which

cover part of the surface and inhibit the reagents access to the surface.

The decomposition of isopropyl alcohol may proceed as dehydrogenation which is an oxidation-reduction process, and as dehydration, which is an acid base process. The effect of added sulfuric, phosphoric, and boric acids, (1.8-14.7%) on the dehydration of isopropyl alcohol has been investigated. Phosphoric and boric acid showed a slight dehydrating effect; sulfuric acid, a marked one. The alkalies exerted a contrary effect, for example, NaOH decreased the dehydration action of ZnO. The effect of acid and neutral salts and their adsorption by ZnO has been also investigated with the use of Na^{24}, S^{35}, and Zn^{65}. The experimental data are compiled in Table 1 (p. 212).

Kinetic curves showing the dehydrogenation and dehydration of isopropyl alcohol on pure ZnO and on ZnO containing small amounts of $ZnSO_4$ (0.3% $ZnSO_4$) are shown in Fig. 21 (p. 213).

The adsorption of $NaHSO_4$ by ZnO is appreciable. NaOH is also easily adsorbed by ZnO, and it is possible that sodium zincate is formed. The adsorption isotherm of NaOH is shown in Fig. 5 (p. 215). For the modifying effect of admixtures on the catalyst

ZHABROVA, G.M.

Radiochemical investigation of the microchemistry of the surface of a zinc oxide catalyst. G. M. Zhabrova (Inst. Phys. Chem., Moscow). *Problemy Kinetiki i Kataliza, Akad. Nauk S.S.S.R.* 8, 289-17(1955).—The radioactive tracers used in the present work were Na^{24}, S^{35}, or Zn^{65}. With ZnO, prepd. at 600° from $ZnCO_3$, the kinetics of the dehydration and dehydrogenation of iso-PrOH were investigated at 380°, with pure ZnO, and with catalyst mixts., i.e. ZnO that contained an admixt. of 0.001 to 0.6% of either NaH_2PO_4, Na_2SO_4, $MgSO_4$, $Al_2(SO_4)_3$, $ZnSO_4$, or $CuSO_4$. The rates of the formation of C_3H_6 or H_2, resp., which are presented, are not of interest in themselves; but by using in these admixts. either a radioactive anion (S) or a radioactive cation (Na, Zn), or both, the migration of the S, Na, or Zn can be followed. The hypothesis of the electron mechanism is entirely suitable to explain the parallelism between the chem. character of adsorption at the surface of an oxide semiconductor catalyst and modifications of its properties.

Werner Jacobson

ZHABROVA, G.M.

AID P - 3170

Subject : USSR/Chemistry

Card 1/1 Pub. 119 - 5/8

Author : Zhabrova, G. M. (Moscow)

Title : Use of isotopic methods in the study of catalysts

Periodical : Usp. khim., 24, 5, 598-612, 1955

Abstract : The literature on establishing the nature of the catalyst surface by the use of radioisotopes is reviewed. The effect of the adsorption of several substances (Na_2SO_4, $NaHSO_4$ and $ZnSO_4$) on the selective action of ZnO is indicated. Methods for studying the surface of catalysts and the distribution of active centers are discussed. One table, 10 diagrams, 76 references, 37 Russian (1936-1955).

Institution : None

Submitted : No date

ZHABROVA, G.M.; FOKINA, Ye.A.

Effect of the method of introducing modifying additives on the properties of oxide catalysts. Izv.AN SSSR.Otd.khim.nauk 86 no.6:963-971 My '55. (MLRA 9:4)

1.Institut fizicheskoy khimii Akademii nauk SSSR.
(Catalysts)

ZHABROVA, G. M.

RUMANIA/Physical Chemistry - Kinetics. Combustion. Explosives. Topochemistry. Catalysis. B-9

Abs Jour : Zhabrova G.M.
Title : Use of Isotope Methods in the Study of Catalysts

Orig Pub : An. Rom.-Sov. Ser. chim., 1956, 10, No 1, 56-72

Abstract : A translation. See RZhKhim, 1956, 6443.

Card 1/1 - 142 -

ZHABROVA, G. M., KADENATSI, B. M.

"Study of the Coke Formation and Divinyl Polymerization on the Catalyst of S. V. Lebedev."

Problemy Kinetics and Catalysis, v. 9, Isotopes in Catalysis, Moscow, Izd-vo AN SSSR, 1957, 442p.

Most of the papers in this collection were presented at the Conf. on Isotopes in Catalysis which took place in Moscow, Nov 31- Apr 5, 1956.

ZHABROVA, G.M.; KADENATSI, B.M.

Coke formation and polymerization of divinyl on the S.V. Lebedeva catalyst. Probl. kin. i kat. 9:187-200 '57. (MIRA 11:3)
(Butadiene) (Polymerization)
(Chemical reaction--Conditions and laws)

ZHABROVA, G.M.; SINITSYNA, M.D.; ROGINSKIY, S.Z.

Use of the emanation method in studying catalysts. Topochemical decomposition of magnesium and zinc carbonates and hydroxides. Dokl. AN SSSR 117 no.2:255-258 N '57. (MIRA 11:3)

1. Institut fizicheskoy khimii Akademii nauk SSSR. 2. Chlen-korrespondent AN SSSR (for Roginskiy).
(Magnesium salts) (Zinc salts)

ZHABROVA, G. M.

5(4) SOV/20-121-4-28/54

AUTHORS: Roginskiy, S. Z. Corresponding Member, Academy of Sciences, USSR, Yanovskiy, M. I., Zhabrova, G. M., Vinogradova, O. M., Kadenatsi, B. M., Markova, Z. A.

TITLE: A Catalytic Synthesis of Unsaturated Hydrocarbons of the Series C_4, Labelled by the Radioactive Carbon C^{14}, With the Use of Vapor Phase Distributive X-Ray Chromatography (Kataliticheskiy sintez nepredel'nykh uglevodorodov ryada C_4, mechennykh radiouglerodom C^{14}, s ispol'zovaniyem parofaznoy raspredelitel'noy radiokhromatografii)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 4, pp 674-677 (USSR)

ABSTRACT: This paper reports on the results of the production of labelled unsaturated hydrocarbons on the basis of ethyl alcohol labelled by C^{14}. It is a peculiarity of this method that all the labelled molecules are produced simultaneously by the same catalytic process which develops under the influence of S. V. Lebedev's catalyst for the synthesis of divinyl.

Card 1/4

SOV/20-121-4-20/54

A Catalytic Synthesis of Unsaturated Hydrocarbons of the Series C_4, Labelled by the Radioactive Carbon C^{14}, With the Use of Vapor Phase Distributive X-Ray Chromatography

This paper discusses a special case of the general principle of the synthesis of labelled molecules. This principle consists of the carrying out of a group synthesis (which gives a mixture of some substances with an unusual isotopic composition) and of the subsequent application of physical-chemical separation methods. Especially interesting is the separation of the labelled hydrocarbons of the C_4 series with various degrees of saturation and with various structural-isomeric shapes. Such hydrocarbons are butadiene (divinyl), α-butylene, β-butylene (cis-variant), β-butylene (trans-variant). The catalytic synthesis was carried out by means of S. V. Lebedev's catalyst at 390°. A labelled ethyl alcohol $C^{14}H_3C^{14}H_2OH$ with the specific radioactivity 0,724 Curie/ml was used for the synthesis. The chromatographic separation of the marked gaseous labelled products is then discussed. A figure shows a typical chromatogram of the mixture of the gaseous radioactive products of the synthesis of divinyl from

Card 2/4

A Catalytic Synthesis of Unsaturated Hydrocarbons of the Series C_4, Labelled by the Radioactive Carbon C^{14}, With the Use of Vapor Phase Distributive X-Ray Chromatography

the labelled alcohol ($C_2^{14}H_5OH$). According to this chromatogram, the main gaseous product is divinyl (81,3 %). The percentage of butylene is not higher than 4,7 %. The composition of the products may be changed by a heat treatment of the catalyst. The specific activities of the hydrocarbons have approximately the same values. In order to identify the individual fractions, their infrared absorption spectra were taken; they are shown by a figure. The combination of chromatography with rectification, extraction and with a counterflow distribution is very promising. These methods are very productive and may be used for the preliminary group separation of a mixture into some fractions with a subsequent extraction of the individual components. The catalytic experiment takes 1 hour and the chromatographic separation - 2 - 2,5 hours. There are 4 figures and 9 references, 7 of which are Soviet.

SOV/20-121-4-28/54

A Catalytic Synthesis of Unsaturated Hydrocarbons of the Series C_4, Labelled by the Radioactive Carbon C^{14}, With the Use of Vapor Phase Distributive X-Ray Chromatography

ASSOCIATION: Institute fizicheskoy khimii Akademii nauk SSSR
(Institute of Physical Chemistry, AS USSR)

SUBMITTED: April 16, 1958

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SOV/62-59-1-35/38

5(4)

AUTHORS: Sinitsyna, M. D., Zhabrova, G. M., Roginskiy, S. Z., Gordeyeva, V. A.

TITLE: Emanating Capacity in Topochemical Processes as a Typical Feature of the Specific Surface (Emaniruyushchaya sposobnost' pri topokhimicheskikh protsessakh kak kharakteristika udel'noy poverkhnosti)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 1, pp 176 - 178 (USSR)

ABSTRACT: In order to investigate the changes of the structure and specific surface in topochemical processes the authors applied the method of emanation. Radiothorium nitrate solution was used as emanation source. The advantage of radiothorium in comparison to the previously used radium (Ref 1) consists in the fact that it forms thoron in systematic transformation. Since thoron has only a short half-life measurements can be carried on without interruption (Refs 1 and 2). In the investigation of magnesium hydroxide and magnesium oxide samples it was found that there is a linear dependence of the emanation coefficient (measured

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at room temperature) on the size of the specific surface. This dependence apparently holds also for other systems. It indicates that the determination of the emanation coefficient can be substituted for comparatively difficult and complicated measurements of sorption. First a calibration curve would have to be plotted for each system, however, according to several points determined by experiments: emanation coefficient - specific surface. There are 1 figure and 5 references, 2 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: June 28, 1958

SOV/80-59-1-30/44

AUTHORS: Yelovich, S.Yu., Zhabrova, G.M., Krivenkova, P.G. and Semenovskaya, T.D.

TITLE: Hydrogenation of Fats in Foam (Gidrogenizatsiya zhirov v pene)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Nr 1, pp 187-193 (USSR)

ABSTRACT: The authors employed the method of hydrogenation of fats in foam which proved already to yield satisfactory results [Ref. 1 to 4]. The present paper describes the results of the hydrogenation of cotton oil in the foam which is formed during the passing of hydrogen through the porous partitions in Schott's filters. This technique leads to a very selective course of the process. The ratio of the hydrogenation rate of olein radicals to that of the saturation of linoleic radicals is equal to 0.01 to 0.04. The analysis of experimental data leads to the conclusion that the foam process proceeded in the kinetic region by all the components of the heterogeneous reaction of catalytic hydration. The electronomicroscopic investigation, carried out by I.I. Tret'yakov and I.A. Bespalova, of the nickel catalyzer obtained from the nickel formate and used in the experiments, leads to the conclusion that the prevailing dimensions of the particles are

0.1 to 0.2 microns.
There are 4 graphs, 1 diagram, 1 microphoto, 3 tables and 8 Soviet references.

SUBMITTED: April 3, 1957

ZHABROVA, G.M.; YEGOROV, Ye.V.

Radiochemical study of the sorption of electrolytes and the chemical interaction between electrolytes and zinc oxide. Radiokhimiia 1 no.5: 538-544 '59. (MIRA 13:2)
(Electrolytes) (Sorption) (zinc oxide)

5(4) SOV/62-59-4-5/42

AUTHORS: Zhabrova, G. M., Gordeyeva, V. A.

TITLE: On Some Factors Determining the Onset of the Induction Period During Topochemical Processes (O nekotorykh faktorakh, opredelyayushchikh poyavleniye induktsionnogo perioda v topokhimicheskikh protsessakh)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 4, pp 596-599 (USSR)

ABSTRACT: It is typical of topochemical processes that an induction period occurs in most cases on the kinetic curves which represent the dependence of the quantity of the substance transformed on the duration of the process. In the present work the thermal decomposition of magnesium hydroxide, magnesium carbonate, zinc carbonate, and potassium bicarbonate has been investigated. To solve the question of the induction period kinetic measurements have been taken at different rates of temperature rise in the reaction apparatus. It has been found that the duration of the induction period and the position of the maximum on the autocatalytic rate curve are determined by the heating conditions of the solids investigated. Figures 2 and 3 show the kinetic curves

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of the dehydration of magnesium hydroxide at 320°, the heating curves and the acceleration curves at a "normal" and "reduced" heating rate. Although the kinetic curves of figures 2 and 3 might be related to different processes in view of their character (Ref 1) they belong actually to one and the same process. The only difference is in the heating rate of the initial material. Similar phenomena have been observed with zinc hydroxide, magnesium carbonate, potassium carbonate, and some other systems. Figure 4 shows autocatalytic curves for potassium bicarbonate. The peak rate is reached approximately at the same time as the temperature. The peak amplitude and the form of the catalytic curve are also determined by the rate of temperature rise. The strong dependence of the induction period on the heating rate is due to the supply of heat and the temperature rise of the solids. There are 4 figures and 9 references, 5 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

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SOV/76-33-11-11/47

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AUTHORS: Zhabrova, G. M., Vladimirova, V. I., Yegorov, Ye. V.

TITLE: Data From the Conference on Physics and Physical Chemistry of Catalysis (March 1958). Influence of Sorbed Impurities on the Catalytic Properties of Zinc Oxide

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 11, pp 2442-2450 (USSR)

ABSTRACT: The sorption of ions may occur on oxide and hydroxide catalysts by dissolution of the catalyst itself. A typical catalyst of this type is zinc oxide. The authors investigated the dependence between the rules governing the sorption of impurities, their chemical character, the stability of the bond, the chemical nature of the impurities and their influence on the activity and selectivity of a zinc oxide catalyst. The investigations were carried out in the sorption of phosphoric acid, sulfuric acid, sodium hydroxide, sodium chloride, and zinc chloride. The quantity of sorbed ions was determined with the radioisotopes Zn^{65}, Cl^{36}, S^{35}, P^{32}, and Na^{24}. The ion exchange was studied by means of zinc oxide by pH measurement after sorption

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Data From the Conference on Physics and Physical Chemistry of Catalysis (March 1958). Influence of Sorbed Impurities on the Catalytic Properties of Zinc Oxide

equilibrium had been attained; a pH-meter of the type LP-5 was used. The sorption of the sodium ions increases with the increase of the pH of the solution, while the sorption of the chloride ions increases with a decrease of the pH. It is assumed that three types of sorption occur with the zinc ion: an irreversible chemical reaction at pH < 6.5 (the formation of a basic zinc sulfate in case of small pH-values from zinc sulfate and sodium hydroxide was already observed by I. V. Tananayev and N. V. Mzareulishvili (Ref 7)), a reversible chemical sorption at pH > 9, and in the third case an ion exchange at pH 6.5-9.5. In analogy to the scheme recommended by B. P. Nikol'skiy (Ref 9) for the sorption properties of aluminum oxide, a corresponding scheme is recommended for zinc oxide. The authors investigated zinc oxide samples, with sorbed impurities, for their catalytic activity with respect to isopropanol decomposition at dynamic conditions and in adsorbed layers (Table 1). Impurities of sodium- and chloride ions increase the dehydrogenation capacity of the catalyst. The sorption of "acid" impurities, such as zinc sulfate and phos-

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[illegible] Chemistry,

5(4) SOV/20-124-2-32/71

AUTHORS: Zhabrova, G. M., Sinitsyna, M. D., Roginskiy, S. Z., Corresponding Member, AS USSR

TITLE: The Application of the Emanation Method in the Investigation of Catalysts (Primeneniye emanatsionnogo metoda k issledovaniyu katalizatorov)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 2, pp 354-357 (USSR)

ABSTRACT: The authors first mention some previous papers on this subject. It is of interest to investigate one of the previously investigated systems in detail by applying radioactive thorium. The magnesium hydroxide used in these experiments was prepared by precipitation from solutions of magnesium nitrate and alkali followed by careful washing with distilled water. A solution of 0.36 g ThO_2/ml (radioactive thorium) in nitric acid was used as a source of emanation. The authors determined the kinetic curves for the time dependence of the emanating power in the course of the dehydration of magnesium hydroxide at the temperatures 320; 350; 400; 450; 550; 600; 700; 800; and 1080°. At

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the same time, the percentage of the conversion of hydroxide into oxide was determined. A continuous increase of the emanating power with time is observed at the temperatures of 320° and 350°. The liberation of thoron becomes much slower towards the end of dehydration. The continuous character of the time dependence of radioactivity is disturbed already at a dehydration temperature of 400°, i.e. there is a flat maximum which corresponds to 75% of conversion. At 450° there is already a clear maximum which corresponds to 70-80% of conversion. A further increase in dehydration temperature continues to increase the sharpness of the maximum. The characteristic shape of the kinetic curves for the time dependence of the emanating power is caused by the simultaneous effect of dehydration and thermal sintering. The second diagram shows the curves for the dependence of the emanation coefficient and of the specific surface on the dehydration temperature of magnesium hydroxide. Both these quantities have a maximum at 450° after which they decrease. The emanating coefficient measured at the temperature of the topochemical process must be described by more complicated functions. The thoron generated seems to

The Application of the Emanation Method in the Investigation of Catalysts

be eliminated only from the superficial layer of the samples of hydroxide and magnesium oxide investigated. There are 3 figures, 1 table, and 7 references, 4 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

SUBMITTED: September 24, 1958

ROGINSKIY, S.Z.; YANOVSKIY, M.I.; LU PEY-CHZHAN; GAZIYEV, G.A.; ZHABROVA, G.M.; KADENATSI, B.M.; BRAZHNIKOV, V.V.; NEYMARK, I.Ye.; PIONTKOVSKAYA, M.A.

Chromatographic determination of the adsorption isotherms of gases and of the specific surface of solids. Kin.i kat. 1 no.2:287-293 Jl-Ag '60. (MIRA 13:8)

1. Institut fizicheskoy khimii AN SSSR.
(Adsorption)

ZHABOTINSKIY, S.N., insh.

Pusher tugs used on small rivers. Rech.transp. 17 no.9:31-33 S '58. (MIRA 11:11)

(Tugboats)